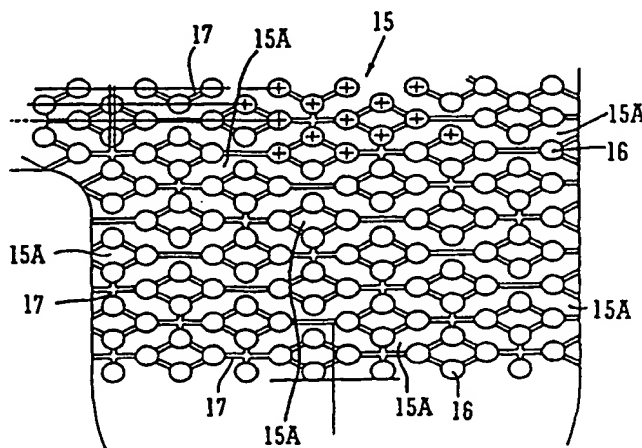




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/GB99/01622 <b>(22) International Filing Date:</b> 21 May 1999 (21.05.99) <b>(30) Priority Data:</b> 9812560.2                      12 June 1998 (12.06.98)                      GB 9903868.9                      20 February 1999 (20.02.99)                      GB <b>(71) Applicant (for all designated States except US):</b> CHART MARSTON LIMITED [GB/GB]; 110 Whitchurch Road, Cardiff CF4 3LY (GB). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> SYMONDS, Keith, Thomas [GB/GB]; 4 Lansdowne Avenue, Codsall, Staffs WV8 2EN (GB). <b>(74) Agent:</b> MOORE, John, Hamilton; J. H. Moore & Co., 8 Gaiafields Road, Lichfield, Staffs WS13 7LT (GB).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>

(54) Title: HEAT EXCHANGER



## (57) Abstract

The invention provides an improved heat exchanger of the so-called "pin-fin" type. The heat exchanger comprises a stack of parallel perforated plates (10, 20, 30, 70, 80), each plate (10, 20, 30, 70, 80) of the stack having perforations (15A), characterised in that the perforations (15A) define an array of spaced column precursors (16, 21, 31), of thickness equal to the plate thickness, the column precursors (16, 21, 31) being joined together by ligaments (17, 22A, 22B, 32, 33), each ligament extending between a pair of adjacent column precursors, the ligaments (17, 22A, 22B, 32, 33) having a thickness less than the plate thickness, the column precursors (16, 21, 31) of any one plate being coincident in the stack with the column precursors (16, 21, 31) of any adjacent plate whereby the stack is provided with an array of individual columns, each column extending perpendicularly to the plane of the plates (10, 20, 30, 70, 80), whereby fluid flowing through the stack is forced to follow a tortuous flow path to flow around the columns.